EXHIBIT A

64. A (co)polymer, exhibiting a stereochemistry and microstructure, as defined by tacticity and sequence distribution, of a polymer formed by a free radical polymerization process and displaying a molecular weight distribution of less than 2.0 and calculable number average molecular weight, having the formula:

$$R^{11}R^{12}R^{13}C\text{-}(M^1)_p\text{-}X,$$

$$R^{11}R^{12}R^{13}C\text{-}(M^1)_p\text{-}(M^2)_p\text{-}X,$$

$$R^{11}R^{12}R^{13}C\text{-}(M^1)_p\text{-}(M^2)_p\text{-}(M^3)_p\text{-}X, \text{ or}$$

$$R^{11}R^{12}R^{13}C\text{-}(M^1)_p\text{-}(M^2)_p\text{-}(M^3)_p\text{-}\ldots\text{-}(M^t)_p\text{-}X$$

wherein X is selected from the group consisting of Cl, Br, I, OR^{10}, SR^{14}, SeR^{14}, $O\text{-}N(R^{14})_2$, $S\text{-}C(=S)N(R^{14})_2$, H, OH, N_3, NH_2, COOH and $CONH_2$ and groups that can be formed therefrom by conventional chemical processes, where

R^{10} is an alkyl of from 1 to 20 carbon atoms in which each of the hydrogen atoms may be independently replaced by halide, R^{14} is aryl or a straight or branched $C_1\text{-}C_{20}$ alkyl group, and where an $N(R^{14})_2$ group is present, the two R^{14} groups may be joined to form a 5- or 6-membered heterocyclic ring,

R^{11}, R^{12} and R^{13} are each independently selected from the group consisting of H, halogen, $C_1\text{-}C_{20}$ alkyl, $C_3\text{-}C_8$ cycloalkyl, $C(=Y)R^5$, $C(=Y)NR^6R^7$, COCl, OH, CN, $C_2\text{-}C_{20}$ alkenyl, $C_2\text{-}C_{20}$ alkynyl oxiranyl, glycidyl, aryl, heterocyclyl, aralkyl, aralkenyl, $C_1\text{-}C_6$ alkyl in which from 1 to all of the hydrogen atoms are replaced with halogen and $C_1\text{-}C_6$ alkyl substituted with from 1 to 3 substituents selected from the group consisting of $C_1\text{-}C_4$ alkoxy, aryl, heterocyclyl, $C(=Y)R^5$, $C(=Y)NR^6R^7$, oxiranyl and glycidyl,

where Y is NR^6, S or O;

where R^5 is an aryl or an alkyl of from 1 to 20 carbon atoms, alkoxy of from 1 to 20 carbon atoms, aryloxy or heterocyclyloxy; and R^6 and R^7 are independently H or alkyl

of from 1 to 20 carbon atoms, or R^6 and R^7 may be joined together to form an alkylene group of from 2 to 5 carbon atoms, thus forming a 3- to 6-membered ring, such that no more than two of R^{11}, R^{12} and R^{13} are H, and R^8 is H, a straight or branched C_1-C_{20} alkyl or aryl, and

M^1, M^2, M^3,... up to M^t are each monomer units derived from radically (co)polymerizable monomer selected such that the monomers units in adjacent blocks are not identical, and t is an integer greater than 3; p for each block is independently selected such that the number average molecular weight of each block is up to 250,000 g/mol;

the following formulas:

$$X\text{-}(M^1)_p\text{-}(R^{12}R^{13}C)\text{-}(R^{11})\text{-}(M^1)_p\text{-}X,$$

$$X\text{-}(M^2)_p\text{-}(M^1)_p\text{-}(R^{12}R^{13}C)\text{-}(R^{11})\text{-}(M^1)_p\text{-}(M^2)_p\text{-}X,$$

$$X\text{-}(M^3)_p\text{-}(M^2)_p\text{-}(M^1)_p\text{-}(R^{12}R^{13}C)\text{-}(R^{11})\text{-}(M^1)_p\text{-}(M^2)_p\text{-}(M^3)_p\text{-}X, \text{ or}$$

$$X\text{-}(M^t)_p\text{-}..\text{-}(M^3)_p\text{-}(M^2)_p\text{-}(M^1)_p\text{-}(R^{12}R^{13}C)\text{-}(R^{11})\text{-}(M^1)_p\text{-}(M^2)_p\text{-}(M^3)_p\text{-}..\text{-}(M^t)_p\text{-}X$$

wherein R^{11}, R^{12}, R^{13}, X, M^1, M^2, M^3,... up to M^t, t, and p are as defined above, with the provisio that R^{11} has a polymer chain as indicated attached thereto;

of the formulas:

$$R^{11}R^{12}R^{13}C\text{-}(M^1\text{-}M^2)_p\text{-}(M^2\text{-}M^1)_p\text{-}(M^1\text{-}M^2)_p\text{-}...\text{-}(M^v\text{-}M^y)_p\text{-}X,$$

$$R^{11'}R^{12'}R^{13'}C\text{-}\{(M^1\text{-}M^2)_p\text{-}(M^2\text{-}M^1)_p\text{-}(M^1\text{-}M^2)_p\text{-}...\text{-}(M^v\text{-}M^y)_p\text{-}X\}_z,$$

$$R^{11}R^{12}R^{13}C\text{-}(M^1\text{-}M^2\text{-}M^3)_p\text{-}(M^3\text{-}M^2\text{-}M^1)_p\text{-}(M^1\text{-}M^2\text{-}M^3)_p\text{-}...\text{-}(M^u\text{-}M^v\text{-}M^y)_p\text{-}X, \text{ or}$$

$$(R^{11'}R^{12'}R^{13'}C)\text{-}\{(M^1\text{-}M^2\text{-}M^3)_p\text{-}(M^3\text{-}M^2\text{-}M^1)_p\text{-}(M^1\text{-}M^2\text{-}M^3)_p\text{-}...\text{-}(M^u\text{-}M^v\text{-}M^y)_p\text{-}X\}_z$$

wherein z is from 2 to 6, R^{11}, R^{12}, R^{13} and X are as defined above, and where $R^{11'}$, $R^{12'}$ and $R^{13'}$ are the same as R^{11}, R^{12} and R^{13} with the proviso that $R^{11'}$, $R^{12'}$ and $R^{13'}$ combined have from 1 to 5 of the polymer chains enclosed in brackets attached thereto and the C has only one of the polymer chains enclosed in brackets attached thereto,

M^1, M^2 and M^3 are monomer units derived from different radically-(co)polymerizable monomers, and M^u is one of M^1 or M^2 or M^3 and M^v is another of M^1 or M^2 or M^3, and M^y is the third (co)monomer,

p for each block is independently selected such that the number average molecular weight of the copolymer is up to 1,000,000 g/mol; and,

(co)polymers of this topology comprising four or more comonomers, and.

of the formulas:

$$(R^{11'}R^{12'}R^{13'}C)\text{-}\{(M^1)_p\text{-}X\}_z,$$

$$(R^{11'}R^{12'}R^{13'}C)\text{-}\{(M^1)_p\text{-}(M^2)_p\text{-}X\}_z,$$

$$(R^{11'}R^{12'}R^{13'}C)\text{-}\{(M^1)_p\text{-}(M^2)_p\text{-}(M^3)_p\text{-}X\}_z, \text{ or}$$

$$(R^{11'}R^{12'}R^{13'}C)\text{-}\{(M^1)_p\text{-}(M^2)_p\text{-}(M^3)_p\text{-}...\text{-}(M^t)_p\text{-}X\}_z$$

wherein z is from 3 to 6; $R^{11'}$, $R^{12'}$ and $R^{13'}$ are the same as R^{11}, R^{12} and R^{13} with the proviso that $R^{11'}$, $R^{12'}$ and $R^{13'}$ combined contain from 2 to 5 of the polymer chains enclosed in brackets attached thereto and the C has only one of the polymer chains enclosed in square brackets attached thereto, where X is as defined above;

M^1, M^2, M^3, ... M^t , p, and t are as defined above; and

and copolymers comprising a block or graft with the above composition; and

of the formula:

$$R^{11}R^{12}R^{13}C\text{-}(M^1{}_sM^2{}_b)\text{-}(M^1{}_cM^2{}_d)\text{-}(M^1{}_eM^2{}_f)\text{-}...\text{-}(M^1{}_gM^2{}_h)\text{-}(M^1{}_iM^2{}_j)\text{-}X, \text{ or}$$

$$R^{11'}R^{12'}R^{13'}C\text{-}\{(M^1{}_aM^2{}_b)\text{-}(M^1{}_cM^2{}_d)\text{-}(M^1{}_eM^2{}_f)\text{-}...\text{-}(M^1{}_gM^2{}_h)\text{-}(M^1{}_iM^2{}_j)\text{-}X\}_z$$

where z is from 2 to 6, R^{11}, R^{12}, R^{13} are as defined above, M^1 and M^2 are as defined above and where $R^{11'}$, $R^{12'}$ and $R^{13'}$ are the same as R^{11}, R^{12} and R^{13} with the proviso that $R^{11'}$, $R^{12'}$ and $R^{13'}$ combined have from 1 to 5 of the polymer chains enclosed in brackets attached thereto and the C has only one of the polymer chains enclosed in square brackets attached thereto, and

a, b, c, d, e, f,... up to i and j are non-negative numbers independently selected such that

a + b = c + d = 100, and any or all of (e + f), (g + h) and (i + j) = 100 or 0, wherein the a:b ratio is from 100:0 to 0:100, the c:d ratio is from 95:5 to 5:95, such that c < a and d > b, and where applicable, the e:f ratio is from 90:10 to 10:90, such that e < c and f > d, and the endpoints of the molar ratio ranges of first monomer to second monomer in successive blocks progressively decrease or increase by 5 such that the e:f ratio is from 5:95 to 95:5, such that e ≠ c and f ≠ d, and the i:j ratio is from 0:100 to 100:0, such that i ≠ e and j ≠ f.

65. (Amended) The (co)polymer of Claim 64, having a formula:

$$R^{11}R^{12}R^{13}C\text{-}(M^1\text{-}M^2)_p\text{-}(M^2\text{-}M^1)_p\text{-}(M^1\text{-}M^2)_p\text{-}\ldots\text{-}(M^v\text{-}M^y)_p\text{-}X,$$

$$(R^{11'}R^{12'}R^{13'}C)\text{-}\{(M^1\text{-}M^2)_p\text{-}(M^2\text{-}M^1)_p\text{-}(M^1\text{-}M^2)_p\text{-}\ldots\text{-}(M^v\text{-}M^y)_p\text{-}X\}_z,$$

$$R^{11}R^{12}R^{13}C\text{-}(M^1\text{-}M^2\text{-}M^3)_p\text{-}(M^3\text{-}M^2\text{-}M^1)_p\text{-}(M^1\text{-}M^2\text{-}M^3)_p\text{-}\ldots\text{-}(M^u\text{-}M^v\text{-}M^y)_p\text{-}X, \text{ or}$$

$$(R^{11'}R^{12'}R^{13'}C)\text{-}\{(M^1\text{-}M^2\text{-}M^3)_p\text{-}(M^3\text{-}M^2\text{-}M^1)_p\text{-}(M^1\text{-}M^2\text{-}M^3)_p\text{-}\ldots\text{-}(M^u\text{-}M^v\text{-}M^y)_p\text{-}X\}_z$$

wherein z is 2 to 6;

wherein R^{11}, R^{12}, R^{13} and X are as previously defined, and where $R^{11'}$, $R^{12'}$ and $R^{13'}$ are the same as R^{11}, R^{12} and R^{13}, with the proviso that $R^{11'}$, $R^{12'}$ and $R^{13'}$ combined have from 1 to 5 of the polymer chains enclosed in brackets attached thereto and the C has only one of the polymer chains enclosed in brackets attached thereto;

M^1, M^2 and M^3 are monomer units derived from different radically-polymerizable or copolymerizable monomers, and M^u is one of M^1, M^2 or M^3 and M^v is another of M^1, M^2 or M^3, and M^y is the third (co)monomer,

p for each block is independently selected such that the number average molecular weight of the copolymer is from 1,000 to 1,000,000 g/mol; and

(co)polymers of this topology comprising four or more comonomers

66. The (co)polymer of Claim 64, having a formula:

$(R^{11'}R^{12'}R^{13'}C)$-$\{(M^1)_p$-$X\}_z$,

$(R^{11'}R^{12'}R^{13'}C)$-$\{(M^1)_p$-$(M^2)_p$-$X\}_z$,

$(R^{11'}R^{12'}R^{13'}C)$-$\{(M^1)_p$-$(M^2)_p$-$(M^3)_p$-$X\}_z$, or

$(R^{11'}R^{12'}R^{13'}C)$-$\{(M^1)_p$-$(M^2)_p$-$(M^3)_p$-...-$(M^t)_p$-$X\}_z$

where $R^{11'}$, $R^{12'}$ and $R^{13'}$ are the same as R^{11}, R^{12} and R^{13} as previously defined, with the proviso that $R^{11'}$, $R^{12'}$ and $R^{13'}$ combined contain from 2 to 5 of the polymer chains enclosed in brackets attached thereto and the C has only one of the polymer chains enclosed in brackets attached thereto, where X is as defined above;

M^1, M^2, M^3,..M^t, p and t are as defined above,

z is from 3 to 6, and copolymers comprising a block or graft with the above composition.

19 67. The (co)polymer of Claim 17 64, having the formulae:

$R^{11}R^{12}R^{13}C$-$(M^1{}_aM^2{}_b)$-$(M^1{}_cM^2{}_d)$-$(M^1{}_eM^2{}_f)$-...-$(M^1{}_gM^2{}_h)$-$(M^1{}_iM^2{}_j)$-X, or

$(R^{11'}R^{12'}R^{13'}C)$-$\{(M^1{}_aM^2{}_b)$-$(M^1{}_cM^2{}_d)$-$(M^1{}_eM^2{}_f)$-...-$(M^1{}_gM^2{}_h)$-$(M^1{}_iM^2{}_j)$-$X\}_z$

where R^{11}, R^{12}, R^{13}, and X are as previously defined, and where $R^{11'}$, $R^{12'}$ and $R^{13'}$ are the same as R^{11}, R^{12} and R^{13} with the proviso that $R^{11'}$, $R^{12'}$ and $R^{13'}$ combined have from 1 to 5 of the polymer chains enclosed in square brackets attached thereto and the C has only one of the polymer chains enclosed in square brackets attached thereto,

M^1 and M^2 are monomer units derived from different radically (co)polymerizable monomers, and a, b, c, d, e, f,... up to i and j are non-negative numbers independently selected such that a + b = c + d = 100, and any or all of (e + f), (g + h) and (i + j) = 100 or 0, wherein the

a:b ratio is from 100:0 to 0:100, the c:d ratio is from 95:5 to 5:95, such that c < a and d > b, and where e≠0 and f≠0, the e:f ratio is from 90:10 to 10:90, such that e < c and f > d, and the endpoints of the molar ratio ranges of first monomer to second monomer in successive blocks progressively decrease or increase by 5 such that the e:f ratio is from 5:95 to 95:5, such that e ≠ c and f ≠ d, and the i:j ratio is from 0:100 to 100:0, such that i ≠ e and j ≠ f, and

z is from 2 to 6.